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DOUBLE-LAYERED FRUIT COVER

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DOUBLE-LAYERED FRUIT COVER

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Claims /2*

1. A double-layered fruit cover, characterized in that it comprises an inner cover, coated or adsorbed with a layer of UV absorber, and an outer cover of primary paper having suitable light-screening property.

2. The double-layered fruit cover described in Claim 1, characterized in that a dispersant is mixed with said UV absorber.

3. The double-layered fruit cover described in Claim 1, characterized in that said UV absorber is coated on the inner side or outer side of the primary paper for said fruit cover, followed by coating said dispersant on the outer-most surface.

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* [Numbers in right margin indicate pagination of the original text.]

4. The double-layered fruit cover described in Claim 1, characterized in that said dispersant is coated on the primary paper for said fruit cover pre-adsorbed with said UV absorber.

5. The double-layered fruit cover described in any of Claims 2-4, characterized in that paraffin wax, plant oils/fats or a synthetic resin is utilized as said dispersant.

Description

This invention pertains to a double-layered fruit cover for fruits that can be discolored and easily dried by exposure to sunlight. /3

Double-layered fruit covers produced by overlapping an outer cover on an inner cover are well known conventionally. For example: Japanese Practical Design Kokai Sho 51[1976]-135139 discloses a fruit cover consisting of a light-screening outer cover and an inner cover comprising pale red or dark red primary paper, in that said inner cover is inserted in the outer cover. When the outer cover is removed from such type of double-layered fruit cover, the inner cover can properly screen the sunlight and protect the fruits from being dried due to exposure.

Judging from the current situation of fruit tree cultivation in recent years, the cultivation of premature fruits has increased, particularly the cultivation of cardamom, and the outer covers are mostly removed from July to August when the sunlight is very strong. Said cultivation is a kind of dwarfing cultivation, and the trees are not tall, so that the branches can be kept from growing too densely, which allows sunlight exposure for the fruits; however, the fruits are easily dried due to the exposure after the outer cover is removed.

Therefore, covering the tree top with a woven cold screen is necessary to shield the fruits from exposure to sunlight, because preventing the fruits from being dried by sunlight exposure is difficult with the conventional double-layered fruit covers after the covers are removed, but placing and removing the screen is cumbersome because special care must be taken with respect to the time for placing and removing the fruit covers, which depend on the intensity of the sunlight and other climate conditions at different times; additionally, the covering efficiency is hardly satisfactory while drying due to sunlight exposure and cannot be totally prevented even if the operation is carefully carried out.

Also, two factors are generally considered to be involved in the drying of fruits from sunlight exposure, namely infrared light (electromagnetic waves with wavelength of about 0.8 μ-1 mm) and ultraviolet light (electromagnetic waves with wavelength of about 3900-10 Å). Additionally, the cultivation areas for early harvesting species of fruits such as "Xia Lu," "La Li Tang," "Lei Bu Ta" and "Ci Jia Lu" in warm areas have increased in recent years, and drying of the fruits from sunlight exposure accelerate from the dual effects of IR rays and UV rays in the middle of summer, including July and August, after the outer layers are removed. Therefore, /4

the causes for drying from sunlight exposure must be eliminated.

Accordingly, the objective of the present invention lies in solving the problems of the conventional techniques, and the present invention is characterized by comprising an inner cover coated or adsorbed with a layer of UV absorber and an outer cover of primary paper having suitable light-screening property, in that the outer cover can be separated from the inner cover.

The present invention is explained in further detail with the following application example exemplified with figures.

Figure 1 and Figure 2 show the cover from one application example of the present invention. As shown in the figures, outer cover 3 of double-layered fruit cover 1 is detachably attached to the outer side of inner cover 2. Hanging groove 4 is furnished at the center of the edge on the front opening, and the upper edge of the opening can be easily drawn closed with said hanging groove 4. Additionally, cut opening 5 is furnished at the lower end of hanging groove 4 and said cut opening is for inserting fruit stem b of fruit a. Cover attaching strip 6 and cover-bottom attaching strip 7 are furnished on outer cover 3 of double-layered fruit cover 1; metal wire 8 for tightening is sealed at the upper end of cover attaching strip 6 while openings 9 for discharging water are furnished at the sides of the cover-bottom attaching strip 7. Said inner cover 2 consists of cylindrically-cut primary paper of pale white, red, blue yellow or green having high refraction for IR rays, and said primary paper is coated with a layer of a mixture; said mixture is prepared by mixing a UV absorber and a dispersant such as paraffin wax, plant oils/fats or synthetic resins. Such UV absorber is preferably capable of absorbing light of wavelength of about 350 mm [sic; μm] and allowing nearly zero transmission of light through the inner cover. Mixtures meeting said performance include, for example, 2-(2-hydroxy-tolyl)-2H-benzotriazole (trade name: Qi Nu Bing P, Japan Ciba-Geigy Company), 2-(2'-hydroxy-4'-octoxy-benzyl)-benzotriazole (trade name: Shi Ming Pu 510, Japan Sumitomo Chemical Company), etc.

The concentration of the UV absorber is preferably at a level capable of preventing drying of the fruits from sunlight exposure after the outer cover is removed. Specifically, the concentration is 2-5 wt% of the weight of the dispersant, preferably about is 3 wt% depending on /5
the property and thickness of the primary paper and coating amount of the dispersant (for example, 5-10 g of dispersant on primary paper 26 g/m^2 of primary paper). Proper light-screening effect is required for said outer cover 3 made into a cylinder with primary paper for protecting apples. Additionally, as shown in Figure 2, the hanging operation of double-layered fruit cover 1 involves inserting fruit stem b through cut opening 5 after fruit a is placed in the fruit cover, followed by tightening the opening of fruit cover 1 from the location of said fruit stem b with metal wire 8.

In the application example of the present invention, inner cover 2 of said double-layered fruit cover 1 is made with pure white thick paper of 26 g/m^2; a mixture is coated on said primary paper at 8 g/m^2, said mixture is prepared from mixing paraffin wax with a UV absorber (trade name: Qi Nu Bing 328), in that the UV absorber is 3% versus paraffin wax based on weight. A comparative example for comparison with fruit cover 1 of the present application example is a fruit cover prepared from paraffin waxed paper containing no additives or UV absorber.

Next, fruits (apples) selected randomly from the same fruit tree on June 5th were placed in the double-layered fruit cover of the application example of the present invention and the fruit cover of the comparative example. The outer covers were removed on August 10th and the inner covers were removed on August 13th while woven cold screens were placed respectively, and the fruits picked on August 20th were investigated for the degree of drying from exposure and for the color condition. Table 1 shows the results. Also, Figure 3 shows the result of measurement of the transmission of rays of various wavelengths through the inner covers.

Table 1

试验区	收获时晒干程度					收获时着色程度				
	无 ←——→ 大					淡 ←——→ 浓				
	1	2	3	4	5	1	2	3	4	5
实施例	93	5	1	1		0	4	10	19	67
比较例	65	13	15	2	5	0	3	11	21	65

Key:
1 Test area
2 Degree of drying at time of picking
3 Color condition at time of picking
4 None ↔ Markedly
5 Pale ↔ Deep
6 Application example
7 Comparative example

- Species tested: Apple (Ci Jia LU)
- Date cover placed: June 5th
- Date outer cover removed: August 10th

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- Date inner cover removed: August 13th

Number of apples tested: 100 each area

- Date picked and investigated: August 20th

As shown in Table 1, for the fruits placed in the double-layered covers of the Comparative example, 35 out of 100 of said fruits suffered from rather severe drying; conversely, for the fruits placed in the double-layered covers of the application example of the present invention, only 7 out of 100 fruits suffered from different degrees of drying even though the outer cover was removed on August 10th during the severe summer season with long sun exposure during the day, showing a significant effect of drying prevention from sunlight exposure. Figure 3 also shows the same result shown in Table 1, in that comparison of the present application example and the comparative example revealed the difference in the transmission of rays of wavelength below 400 mm.

An application example of the present invention was described above, but the present invention is not limited to the aforementioned application example, and various modifications and changes can be made based on the spirit of the present invention.

For example, a mixture prepared by lending the UV absorber and the dispersant is coated on the primary paper of the fruit cover, but the UV absorber may be coated on the inner side or the outer side of the primary paper for producing the fruit cover, followed by coating the dispersant on top, or coating the dispersant on a primary paper pre-adsorbed with the UV absorber.

As shown above, the double-layered fruit cover of the present invention consists of an inner cover coated with a UV absorber and a detachable outer cover having proper light-screening effect; accordingly, there is no concern of drying due to sunlight exposure after the outer cover is removed and no cold screen is required, and the outer cover can be removed at the most appropriate time during the growth of the various kinds of fruits. The double-layered cover of the present invention is particularly suitable for fruits requiring coloring while easily being dried from sunlight exposure; not only can the drying from sunlight exposure be prevented, the color of the fruits can be enhanced simultaneously while increasing the sugar component and accelerating maturing. /7

Brief description of the figures

Figure 1-3 shows an application example of the present invention; Figure 1 is a front projecting diagram, Figure 2 is a front projecting diagram with a fruit in the cover, while Figure

3 shows the transmission of rays of various wavelengths through inner cover after the outer cover is removed.

1 – Double-layered fruit cover 1 – Inner cover

3 – Outer cover 4 – Fruit

Accompanying figures of the description

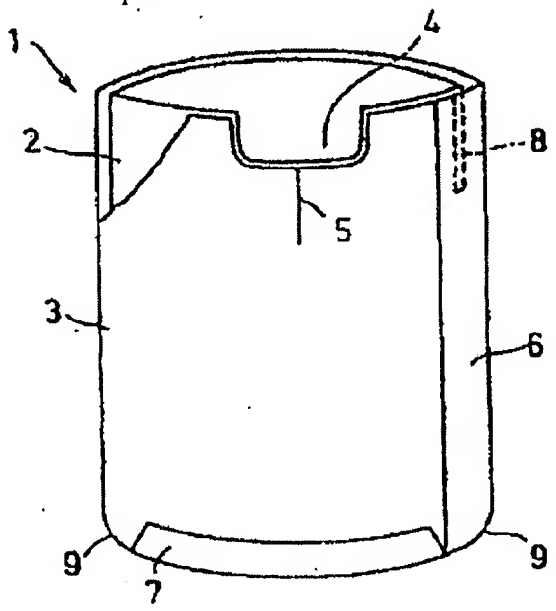

Figure 1

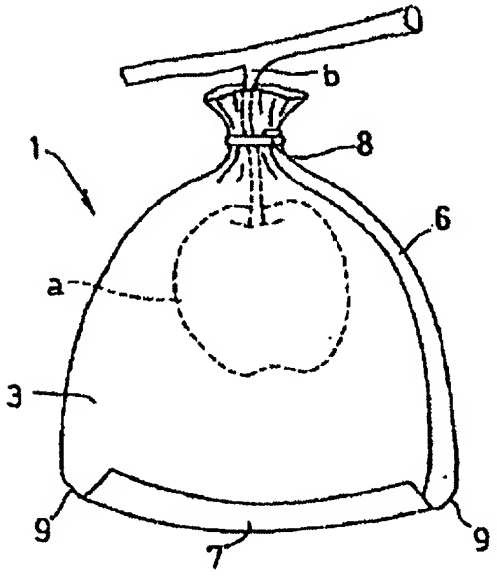

Figure 2

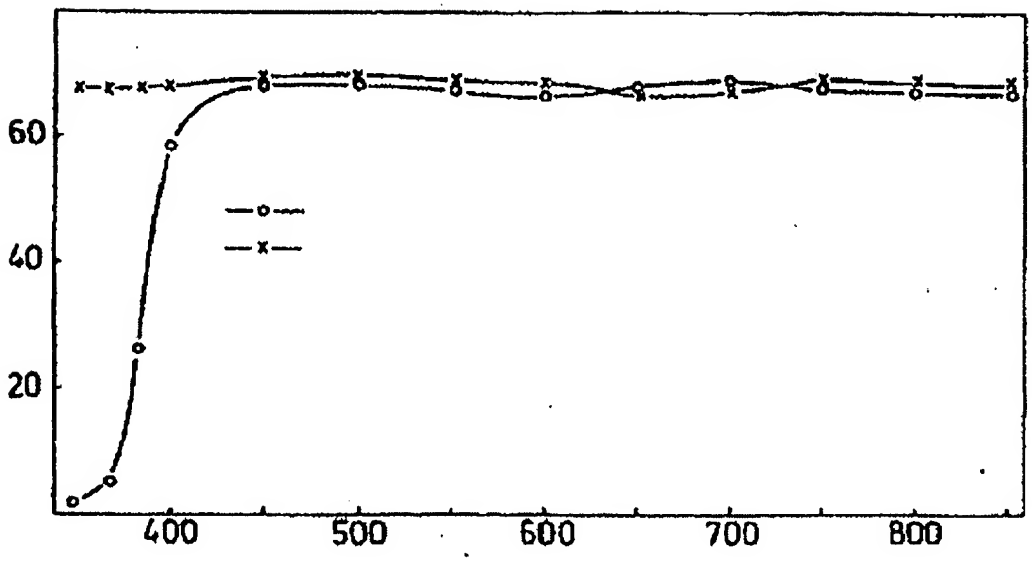

Figure 3